IN THE CLAIMS:

Please amend claim 1. Please cancel claims 16 and 19 without prejudice. Please add new claims 27-31. Claims 1-15, 17, 18 and 20-31 are pending in the application.

1. (Currently Amended) A reactor for extended growth of ~~growing~~ a gallium containing single crystal on a substrate, comprising:

a reactor tube;

a substrate positioned in the reactor tube;

a multi-zone heater;

a growth zone in the reactor tube, wherein said multi-zone heater maintains said substrate within said growth zone at a growth temperature greater than 850°C.;

an extended gallium source ~~at least~~ partially inside and partially outside of the reactor tube and within a multi-zone gallium source zone, said extended gallium source having a length so that different portions of said extended gallium source are maintained at different temperatures, said extended gallium source being controllably positionable so that said multi-zone heater maintains a first portion of said extended gallium source at a first temperature greater than 450°C. while simultaneously maintaining a second portion of said extended gallium source at a second temperature in the range of 30°C. to 100°C., wherein upon reaction initiation said second portion at said second temperature comprises at least 50 percent of said extended gallium source;

a halide reaction gas source coupled to said multi-zone gallium source zone;

an inert gas source coupled to said multi-zone gallium source zone to transport a first reaction product from said multi-zone gallium source zone to said growth zone; and

a reaction gas source coupled to said growth zone, ~~; and~~

growth of the gallium-containing single crystal occurring on the substrate in the reactor tube.

2. (Previously Amended) The reactor of claim 1, said extended gallium source being controllably positionable so that upon reaction initiation said second portion comprises at least 90 percent of said extended gallium source.

3. (Previously Amended) The reactor of claim 1, said extended gallium source being controllably positionable so that said second temperature is in the range of 30°C. to 40°C.

4. (Previously Amended) The reactor of claim 1, further comprising a first aluminum source zone, wherein said halide reaction gas source and said inert gas source are coupled to said first aluminum source zone, and said first aluminum source zone being controllably positionable so that said multi-zone heater maintains said first aluminum source within said first aluminum source zone at a third temperature.

5. (Previously Amended) The reactor of claim 4, further comprising a second aluminum source zone, wherein said halide reaction gas source and said inert gas source are coupled to said second aluminum source zone, and said first aluminum source zone being controllably positionable so that said multi-zone heater maintains said second aluminum source within said second aluminum source zone at a fourth temperature.

6. (Original) The reactor of claim 1, wherein said multi-zone heater is a multi-zone resistive heater furnace.

7. (Original) The reactor of claim 1, further comprising an acceptor impurity source zone, wherein said inert gas source is coupled to said acceptor impurity source zone, and wherein said multi-zone heater maintains an acceptor impurity within said acceptor impurity source zone at a third temperature.

8. (Original) The reactor of claim 1, further comprising a donor impurity source zone, wherein said inert gas source is coupled to said donor impurity source zone, and wherein said multi-zone heater maintains a donor impurity within said donor impurity source zone at a third temperature.

9. (Original) The reactor of claim 1, further comprising means for transferring said at least one substrate within said growth zone to a second growth zone.

10. (Original) The reactor of claim 9, wherein said multi-zone heater maintains said at least one substrate within said second growth zone at a third temperature.

11. (Original) The reactor of claim 10, wherein said growth temperature is in the range of 1,000°C. to 1100°C. and wherein said third temperature is in the range of 850°C. to 1,000°C.

12. (Original) The reactor of claim 1, wherein said halide gas source supplies HCl gas.

13. (Original) The reactor of claim 1, wherein said reaction gas source supplies ammonia gas.

14. (Previously Presented) The reactor of claim 1 being configured for use with a modified hydride vapor phase epitaxial (HVPE) process.

15. (Previously Presented) The reactor of claim 1, further comprising a control rod, said control rod being manipulated to control the position of said extended gallium source.

16. (Canceled).

17. (Previously Presented) The reactor of claim 1, said extended gallium source being moveable between a first position and a second position.

18. (Previously Presented) The reactor of claim 17, wherein the entire extended gallium source is within the reactor tube at both of the first and second positions.

19. (Canceled).

20. (Previously Presented) The reactor of claim 17, said extended gallium source being controllably positioned so that the extended gallium source is moveable into and out of the reactor tube.

21. (Previously Presented) The reactor of claim 1, said extended gallium source comprising an extended gallium source tube.

22. (Previously Presented) The reactor of claim 1, said extended gallium source being controllably moveable relative to the reactor tube.

23. (Previously Presented) The reactor of claim 1, said substrate being moveable independently of said extended gallium source.

24. (Previously Presented) The reactor of claim 1, said substrate being in the reactor tube and separate from said extended gallium source.

25. (Previously Presented) The reactor of claim 4, wherein said third temperature is greater than about 700°C.

26. (Previously Presented) The reactor of claim 6, wherein said fourth temperature is greater than about 700°C.

27. (New) The reactor of claim 1, wherein the extended gallium source is a two kilogram extended gallium source.

28. (New) The reactor of claim 1, wherein the difference between the temperature of the first portion of said extended gallium source and the temperature of the second portion of said extended gallium source is at least 350°C.

29. (New) The reactor of claim 1, wherein the difference between the temperature of the first portion of said extended gallium source and the temperature of the second portion of said extended gallium source is about 350°C to about 420°C.

30. (New) The reactor of claim 1, wherein difference between the temperature of the first portion of said extended gallium source and the temperature of the second portion of said extended gallium source is about 550°C. to about 620°C.

31. (New) The reactor of claim 1, wherein difference between the temperature of the first portion of said extended gallium source and the temperature of the second portion of said extended gallium source is about 750°C. to about 820°C.